

Appl. No. 09/982,486

Amdt. Dated April 30, 2004

Reply to Office Action of March 15, 2004

AMENDMENTS TO THE CLAIMS

The following listing of the claims will replace all prior versions and listings of the claims in the application.

Listing of Claims

1. (Currently Amended) A method of obtaining a desired mixture of at least two substances light sources, the substances light sources being mixed in a proportion, the desired mixture having at least one optical property that is influenced by the proportion of the substances light sources in the desired mixture, the desired mixture having a desired range for the optical property, the method comprising the steps of:

mixing the substances light sources to form a working mixture, each of the light sources having an initial weight and a spectral content;

preparing a prototype with the working mixture;

measuring the optical property of the prototype;

determining an initial weighted optical property of the working mixture based on the initial weights and spectral contents of the light sources;

adjusting the initial weights of the light sources until the initial weighted optical property of the working mixture converges with the measured optical property of the prototype;

comparing the optical property of the prototype with the desired range;

~~calculating an adjustment in the proportion of the substances; and~~

~~repeating the above steps until the property of the prototype is within the desired range~~
adjusting the proportion of the light sources until the measured optical property of the prototype converges within the desired range.

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2. (Original) The method according to claim 1, the property comprising color.
3. (Currently Amended) The method according to claim 1, the desired mixture comprising at least three light sources substances.
4. (Currently Amended) The method according to claim 3: the property comprising at least two coordinates; each coordinate being influenced by the proportion of the light sources substances; and the desired range having a desired subrange for each coordinate.
5. (Original) The method according to claim 4: the property comprising color; and the coordinates being chromaticity coordinates.
6. (Currently Amended) The method according to claim 1, said initial weights adjusting calculating comprising using a computer, and said proportion adjusting comprising using a computer.
7. (Currently Amended) The method according to claim 6, said initial weights adjusting calculating comprising using a spreadsheet program, and said proportion adjusting comprising using a spreadsheet program.

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8. (Currently Amended) The method according to claim 6: said proportions adjusting ~~calculating~~ comprising dividing the property into component bands; and ~~performing calculations on~~ calculating adjustments for each band.

9. (Currently Amended) The method according to claim 6, said initial weights ~~adjusting~~ ~~calculating~~ comprising performing iterative calculations, and said proportions adjusting ~~comprising performing iterative calculations.~~

10. (Currently Amended) The method according to claim 9: the desired range having a target; and said proportion adjusting ~~calculating~~ comprising forcing convergence between the measured optical property and the target.

11. (Currently Amended) The method according to claim 1: said proportion adjusting ~~calculating~~ comprising: determining quantities of the light sources ~~substances~~ to add to the working mixture; ~~said repeating the above steps comprising:~~ adding the quantities to the working mixture[,]; and mixing the light sources ~~substances~~ to form a slightly different working mixture.

12. (Currently Amended) The method of claim 11: the property comprising color; the coordinates being chromaticity coordinates; said proportion adjusting ~~calculating~~ comprising using: a personal computer, and a spreadsheet program; and the light sources ~~substances~~ being phosphors.

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13. (Currently Amended) A method for determining a proper combination for obtaining a color within a desired range, the method comprising the steps of:

~~calculating quantities of sources of color phosphors, each of the phosphors having an initial weight and a spectral content;~~

~~combining the sources of color phosphors;~~

~~preparing a prototype;~~

~~measuring the chromaticity of the prototype;~~

~~determining an initial weighted chromaticity of the prototype based on the initial weights and spectral contents of the phosphors;~~

~~adjusting the initial weights of the phosphors until the initial weighted chromaticity of the prototype converges with the measured chromaticity of the prototype;~~

~~determining if the chromaticity of the prototype is within the desired range; and~~

~~repeating the above steps until the chromaticity of the prototype is within the desired range~~

~~adjusting the quantities of the phosphors until the measured chromaticity of the prototype converges within the desired range.~~

14. (Currently Amended) The method according to claim 13, the prototype comprising at least three ~~sources of color phosphors~~.

15. (Currently Amended) The method according to claim 13, said quantities adjusting ~~calculating~~ comprising using: a computer; and a spreadsheet program.

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Cancel claim 16 without prejudice.

17. (Currently Amended) The method according to claim ~~16~~ 13, the prototype being a lamp.

18. (Original) The method according to claim 17 further comprising the step of manufacturing liquid crystal displays.

19. (Currently Amended) The method according to claim 13: said quantities adjusting calculating comprising: determining an adjustment of the ~~sources of color~~ phosphors; and said ~~repeating the above steps comprising~~ adding the adjustment to the calculated quantities of ~~sources of color~~ phosphors.

Cancel claim 20 without prejudice.

21. (Currently Amended) The method according to claim ~~20~~ 19 further comprising the step of manufacturing lamps for backlighting in avionics applications.

22. (Currently Amended) The method according to claim 13, said quantities adjusting calculating comprising dividing the measured chromaticity into component wavelength bands.

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23. (Original) The method according to claim 22, the wavelength bands each being substantially the same width.

24. (Original) The method according to claim 23, the wavelength bands each being: at least one nanometer wide; and no more than 3 nanometers wide.

25. (Currently Amended) The method according to claim 13, said quantities adjusting ~~ealeulating~~ comprising performing iterative calculations.

26. (Currently Amended) The method according to claim 25: the desired range having a target; and said quantities adjusting ~~ealeulating~~ comprising forcing convergence between the measured chromaticity property and the target.

27. (Currently Amended) A computer implemented method for determining a proper mixture of phosphors for manufacturing florescent lamps that produce a chromaticity within a desired range, the method comprising the steps of:

calculating the proportion of each phosphor to obtain the desired chromaticity, each of the phosphors having an initial weight and a spectral content;

mixing the phosphors to form a first working mixture;

preparing a first prototype using the first working mixture;

measuring the chromaticity of the first prototype;

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determining an initial weighted chromaticity of the first working mixture based on the initial weights and spectral contents of the phosphors;

adjusting the initial weights of the phosphors until the initial weighted chromaticity of the first working mixture converges with the measured chromaticity of the first prototype;

using a computer, calculating a first adjustment in phosphor quantities;

adding the first adjustment in phosphor quantities to the first working mixture to form a second working mixture;

preparing a second prototype using the second working mixture; and

measuring the chromaticity of the second prototype; and

adjusting the quantities of the phosphors until the measured chromaticity of the second prototype converges within the desired range.

28. (Original) The method according to claim 27, said calculating comprising: dividing the relevant spectrum into wavelength bands; and performing calculations on each wavelength band.

29. (Original) The method according to claim 28, the calculations comprising hard coded values specifically for the phosphors being used.

30. (Original) The method according to claim 29, said hard coded values having been empirically determined by constructing a single-phosphor lamp with each substantially pure phosphor and measuring the chromaticity of each single phosphor lamp.

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31. (Original) The method according to claim 27, said calculating comprising performing calculations using tristimulus values.

32. (Original) The method according to claim 27, said calculating comprising performing iterative calculations until convergence is achieved.

33. (Original) The method according to claim 27 further comprising the steps of:
using the computer, calculating a second adjustment in phosphor quantities;
adding the second adjustment in phosphor quantities to the second working mixture to form a third working mixture;
preparing a third prototype using the third working mixture; and
measuring the chromaticity of the third prototype.

34. (Currently Amended) The method according to claim 33, said calculating comprising:

dividing the relevant spectrum into at least ten wavelength bands and performing calculations on each wavelength band[;], the calculations comprising hard coded values unique to the phosphors being used;
performing calculations using tristimulus values; and
performing iterative calculations until convergence is achieved.

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35. (Original) The method according to claim 33 further comprising the step of manufacturing active matrix liquid crystal displays for avionics applications.

36. (Original) The method according to claim 33 further comprising the steps of:
using the computer, calculating a third adjustment in phosphor quantities;
adding the third adjustment in phosphor quantities to the third working mixture to form a fourth working mixture;
preparing a fourth prototype using the fourth working mixture; and
measuring the chromaticity of the fourth prototype.